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MICROSCOPY.[1]

MAYER'S METHOD OF FIXING MICROSCOPICAL SECTIONS.[2]—The new fixative proposed by Dr. Mayer is prepared by mixing *the filtered white of eggs with an equal volume of glycerine.*[3] A little carbolic acid may be added as an antiseptic. A very thin and even layer of the fixative is painted upon the object-slide, which is then ready for receiving the sections. After the sections are placed, the slide is warmed a few minutes in the oven of a water-bath, just long enough to melt the paraffine. The paraffine is next dissolved away from the sections by turpentine, the turpentine removed by alcohol, and the sections then colored *in situ* on the slide.

As a coloring fluid, a strong alcoholic carmine is recommended. It is prepared as follows:

Dissolve four grams carmine in 100^{ccm} alcohol (eighty per cent) by boiling about thirty minutes, adding thirty drops of strong hydrochloric acid during the boiling. The solution should be filtered while hot, and the acid carefully neutralized by adding ammonia until carmine begins to be precipitated.

This fluid, which may require to be filtered a second time after cooling, stains uncommonly quick, deep and diffuse. To obtain a differential staining, it is well to stain deeply, and then partially decolor by washing with acidulated alcohol.

The decoloration should be checked at the moment when the film of the fixative become nearly or quite colorless.

PERCHLORIDE OF IRON AS A REAGENT FOR PRESERVING DELICATE MARINE ANIMALS.—In experimenting with a delicate class of marine infusoria (Tintinnodea), Dr. Fol[4] found that the reagents in common use for instantaneous killing, such as picro-sulphuric acid, osmic acid alone or in combination with chromic and acetic acid, and corrosive sublimate, failed to give successful preparations. He finally succeeded with perchloride of iron, a reagent quite new in histological technique. An alchoholic solution diluted to about two per cent will answer ordinary purposes; but a stronger solution should be used in case it is desired to kill a large number of animals in a large vessel. It will not do, however, to turn a saturated solution directly into sea-water, as precipitates would be copiously formed, which would utterly ruin the preparations. After the animals have sunk to the bottom of the vessel, most of the water may be turned off, and seventy per cent alcohol added. In order to remove from the tissues the ferric salts adhering to them, it is necessary to replace this alcohol with alcohol containing a few drops of hydrochloric acid.

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[1] Edited by Dr. C. O. WHITMAN, Mus. Comp. Zool., Cambridge, Mass.

[2] Dr. Paul Mayer. "Einfache Methode zum Aufkleben mikroskopischer."

[3] Glycerine serves to keep the fixative moist while the sections are being placed. Schmitte. Mittheil Zoolog. Station at Naples, IV, p. 521, 1883.

[4] Fol, Beiträge zur histologischen Technik. Zeitschr. f. wiss. Zool. XXXVIII, p. 491, 1883.

The "fixation" of the animals in an expanded life-like form is perfect, and the action of the dilute acid is of so short duration that it causes no injury to the tissues. Not only infusoria and rhizopods, but also large pelagic animals, such as Medusæ, Ctenophoræ, Salpæ, Heteropods, Doliolum, &c., may be thus killed and transferred to alcohol, with their form, histological structure, and cilia perfectly preserved. After complete removal of the yellowish color due to the presence of ferric salts by washing in acidulated alcohol, the tissues of transparent animals remain almost free from cloudiness.

The best method of staining such objects is to add a few drops of gallic acid (one per cent solution) to the alcohol. After twenty-four hours the acidulated alcohol is turned off and pure alcohol added. Thus treated the protoplasm will take a light brown color, the nuclei a much deeper brown. Carmine stains too deeply and diffusely, and cannot be successfully removed.

THE PREPARATION OF DRY INJECTION-MASSES.—The variously colored gelatine emulsions in common use as injections, keep for only a short time, and have therefore to be prepared as occasion arises for their use. The dry emulsions recommended by Fol are very easily prepared and convenient in use. As they will keep for any length of time, they can be prepared in quantities, and thus be ready for use at any moment.

Carmine Emulsion.—One kilogram gelatine (softer kind used in photography), soaked in water for a few hours until thoroughly softened; after turning off the water, heat the gelatine over a water bath until liquified; and then add to it, little by little, one liter of a strong solution of carmine in ammonia. The mixture stiffened by cooling is cut up, and the pieces packed in a fine piece of netting. Vigorous pressure with the hand under water forces the emulsion through the net in the form of fine strings or vermicelli. These strings are placed in a sieve and washed until they are free from acid or excess of ammonia; then collected and re-dissolved by heating. The liquid is poured upon large sheets of parchment which have been saturated with paraffine, and these sheets are then hung up to dry in an airy place. The dried layers of the emulsion, which are easily separated from the parchment, may be cut into strips and placed where they are protected from dust and dampness.

The carmine solution used in this emulsion is prepared as follows:

A strong solution of ammonia is diluted with 3–4 volumes of water, and carmine added in excess. After filtering, the solution is mixed with the gelatine, and then enough acetic acid added to change the dark purple-red into blood-red. It is not necessary to completely neutralize the ammonia.

The dry emulsion requires only to be placed in water for a few minutes and melted over the water-bath, to be ready for use.

Blue Emulsion.—A slightly modified form of Thiersch's formula:

1. To 300^{ccm} of melted gelatine add 120^{ccm} of a cold-saturated solution of green vitriol (ferro-sulphate).

2. To 600^{ccm} of melted gelatine add first 240^{ccm} of a saturated solution of oxalic acid, then 240^{ccm} of a cold saturated solution of red prussiate of potash (potassic ferricyanide).

3. No. 1 poured slowly into No. 2 while stirring vigorously; the mixture heated for fifteen minutes.

4. After cooling, the emulsion is pressed through netting, the vermicelli washed and spread on waxed paper for drying. In this case the vermicelli must be dried directly, as they do not melt well without the addition of oxalic acid.

The dry vermicelli are prepared for use by first soaking in cold water, and then heating with the addition of oxalic acid enough to reduce them to a liquid.

Black Emulsion. — 1. Soak 500 g. gelatine in two liters of water, in which 140 g. of common salt have previously been dissolved, and melt the mass on the water-bath.

2. Dissolve 300 g. nitrate of silver in 1 liter distilled water.

3. No. 2 poured very slowly into No. 1 while stirring. An extremely fine-grained emulsion may be obtained by using 3–4 times as much water in Nos. 1 and 2.

4. No. 3 pressed into vermicelli as above, and then mixed with No. 5 by clear daylight.

5. Mix 1½ liter cold-saturated potassic oxalate with 500^{ccm} of a cold-saturated solution of ferro-sulphate.

6. No. 4 mixed with No. 5 gives a thoroughly black emulsion, which should be washed several hours, again melted and finally poured in a thin layer on waxed paper.

A gray-black emulsion may be obtained by using 240 g. potassic bromide in the place of common salt in No. 1, the remaining operations being the same.

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SCIENTIFIC NEWS.

— The Trustees of Williams College engaged last spring, for a series of years, one of the tables at Dohrn's International Zoölogical Station at Naples. It has until recently been occupied by Dr. Edmund B. Wilson, a graduate of the Sheffield Scientific School, and of the Johns Hopkins University.

His occupancy of the table illustrates the principles which will guide the authorities of the college in making an appointment to this trust. Any American naturalist, already distinguished for research, may apply for the use of the table by writing to President Carter. And while a graduate of Williams College, of scholarly eminence, will be regarded as having a superior claim, the appointment will, in no case, be given to a